



Dupe Info

May 11, 1993

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Mr. Wayne Grotheer  
Van Waters & Rogers Inc.  
6100 Carillon Point  
Kirkland, Washington 98033

Pilot Boring Program Summary  
Boise Towne Square Mall  
Boise, Idaho

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Dear Wayne:

Harding Lawson Associates (HLA) has prepared this letter for Van Waters & Rogers Inc. (VW&R) to summarize the pilot boring activities that were recently completed at the Boise Towne Square Mall, Boise, Idaho. The scope of work for the pilot boring program was originally presented in the *Supplemental Pilot Boring Sampling and Analysis Plan, Boise Towne Square Mall, Boise, Idaho* dated February 9, 1993 (Pilot Boring SAP). The scope consisted of drilling two pilot borings, collecting groundwater samples in the borings for vertical profiling, completing the borings as groundwater monitoring wells, collecting and analyzing groundwater samples from the wells, and conducting a geophysical pilot study. A more detailed description of the pilot boring program will be provided in the upcoming Boise Towne Square Mall Monitoring Well Sampling and Analysis Plan.

The field work was conducted between March 26 and April 23, 1993. Drilling, sample collection, equipment decontamination, and other field activities were conducted in accordance with the Pilot Boring SAP and the Quality Assurance Project Plan dated November 2, 1992. Two borings were drilled; MW-1 is located in the parking lot north of the Olive Garden restaurant and MW-2 is in the parking lot approximately 150 feet northeast of the State Well MW-1, north of the Pier 1 Import store. The borings were drilled under the supervision of HLA and VW&R representatives by Hiddleston Drilling and Pump, Mountain Home, Idaho, using air casing hammer techniques to maximum depths of 158 feet. The borings were logged by an HLA geologist using soil cutting samples collected at five-foot intervals. Copies of the boring logs are attached. The lithologic logs show, in general, extensive sand and gravel in the upper 150 feet.

Chemical profiling was performed in the borings when possible. As the borings were advanced, groundwater samples (grab groundwater samples) were collected using a stainless steel bailer lowered through the casing to the bottom of the boring. Grab groundwater samples were collected from the boring for Well MW-1 at depths of

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58 feet and 78 feet. Grab groundwater samples were collected from the boring for Well MW-2 at depths of 58 feet and 98 feet. These samples were sent under chain of custody to and analyzed by ATI Laboratory (ATI), Renton, Washington, for halogenated and aromatic volatile organic compounds (VOCs) using EPA Test Methods 8010 and 8020.

Following drilling, the borings were completed as groundwater monitoring wells. Well completion diagrams are included on the attached boring logs. Although the total depth of the borings was 158 feet, heaving sands prevented installation of the monitoring wells to that depth. The total depth for Well MW-1 is 128 feet with a screened interval of 108 to 128 feet. Well MW-2 was completed at a total depth of 137 feet with a screened interval of 117 to 137 feet. During completion of Well MW-2, the upper 68 feet of steel casing used during drilling of the borehole was cemented in place. The presence of the steel casing should have no impact on the integrity of the well or quality of groundwater samples collected from the well. The wells were sampled on April 21 and 22, 1993, and analyzed by ATI for halogenated and aromatic VOCs using EPA Test Methods 8010 and 8020.

The analytical results for the grab groundwater samples and samples from the completed wells are presented in Table 1 (attached). Copies of the laboratory analytical reports are also attached. Analytical results for grab samples collected from the boring for MW-1 indicate that perchloroethylene (perc) was detected in the 58-foot and 78-foot samples at concentrations of 650 micrograms per liter ( $\mu\text{g/l}$ ) and 1  $\mu\text{g/l}$ , respectively. The sample collected from the completed Well MW-1 did not contain perc. Grab samples collected from the boring for MW-2 indicate that perc was detected at a concentration of 2.1  $\mu\text{g/l}$  in the 58-foot sample and was not detected in the 98-foot sample nor in the sample collected from the completed well.

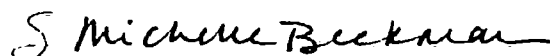
The seismic reflection pilot study and geophysical logging of Well MW-1 were conducted between April 12 and 16, 1993. Results of the geophysical activities were presented in the *Geophysical Sampling and Analysis Plan* letter dated May 6, 1993. The geophysics pilot study in general showed that seismic reflection is a viable tool for evaluating the presence and extent of potential aquitards in this area. However, future surface geophysical surveys are not proposed at this time since the significant seismic reflection zones were detected at depths much greater than the depths at which perc was detected.

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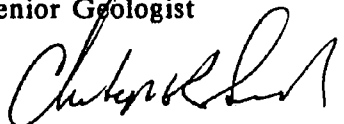
If you have any questions or would like to discuss the results presented in this letter,  
please contact either of the undersigned at (415) 892-0821.

Very truly yours,

HARDING LAWSON ASSOCIATES



S. Michelle Beekman  
Senior Geologist

  
Christopher R. Smith, PG 736  
Principal Hydrogeologist

Attachments: Table 1  
Boring Logs  
Laboratory Analytical Results

cc: Mr. Ron Lane  
Mr. Rob Howarth  
Mr. Michael Gaudette  
Ms. Carol Sanders  
Mr. Scott Vokey  
Mr. Tom Mulkey  
Ms. Susan Zachos  
Mr. John Lerma

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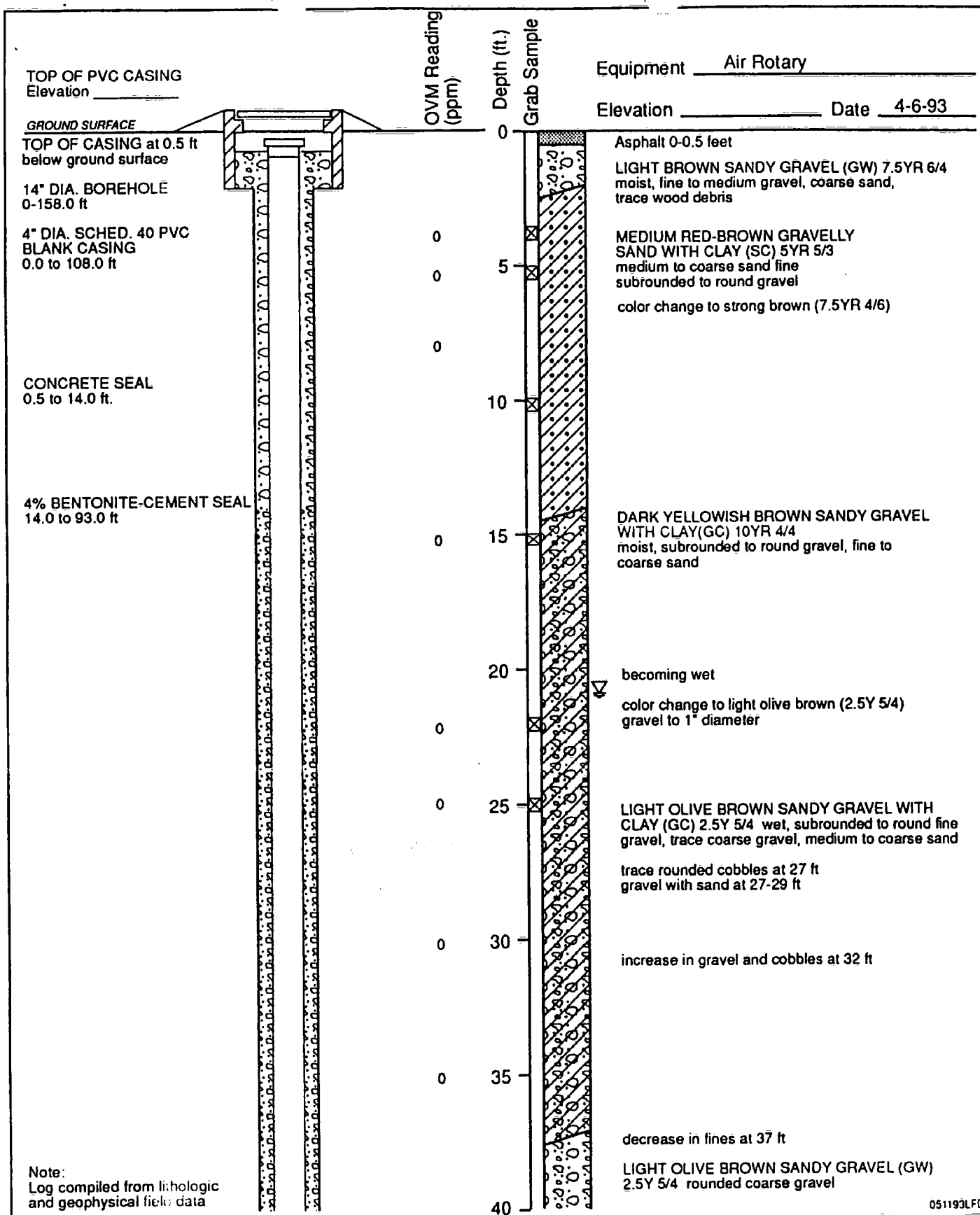
**Table 1**  
**Pilot Boring Groundwater Analytical Results**

Sample Number	Sample Date	Location	Depth (feet)	Sample Type	Pero Concentration (ug/l)	Other Detected Analytes (ug/l)	Comments
93033101	3/31/93	MW-1-boring	58	Bailer	650	ND	
93033102	3/31/93	Equip. Blank	NA	QC	0.3	Toluene - 0.7 1,1,1 TCA - 2.8	Not detected in samples
93033103	3/31/93	Trip Blank	NA	QC	ND <0.2	Toluene - 0.5	Not detected in samples
93033104	3/31/93	MW-1-boring	78	Bailer	1	ND	
93041501	4/15/93	MW-2-boring	58	Bailer	2.1	ND	
93041502	4/15/93	MW-2-boring	98	Bailer	ND <0.2	ND	
93041601	4/16/01	Trip Blank	NA	QC	ND <0.2	Toluene - 1.0	Not detected in samples
93042101	4/21/93	MW-1-well	128	Well	ND <0.2	ND	
93042102	4/21/93	MW-1-well (dup)	128	Well/QC	ND <0.2	ND	
93042103	4/21/93	Trip Blank	NA	QC	ND <0.2	Toluene - 1.0	Not detected in samples
93042104	4/21/93	Equip. Blank	NA	QC	ND <0.2	ND	
93042201	4/22/93	MW-2-well	137	Well	ND <0.2	ND	

NA = Not Applicable

ug/l = micrograms per liter

Note: Toluene detected in trip blanks is likely a laboratory contaminant



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**Log of Boring and Well Completion MW-1**  
Van Waters & Rogers Inc.  
Boise, Idaho

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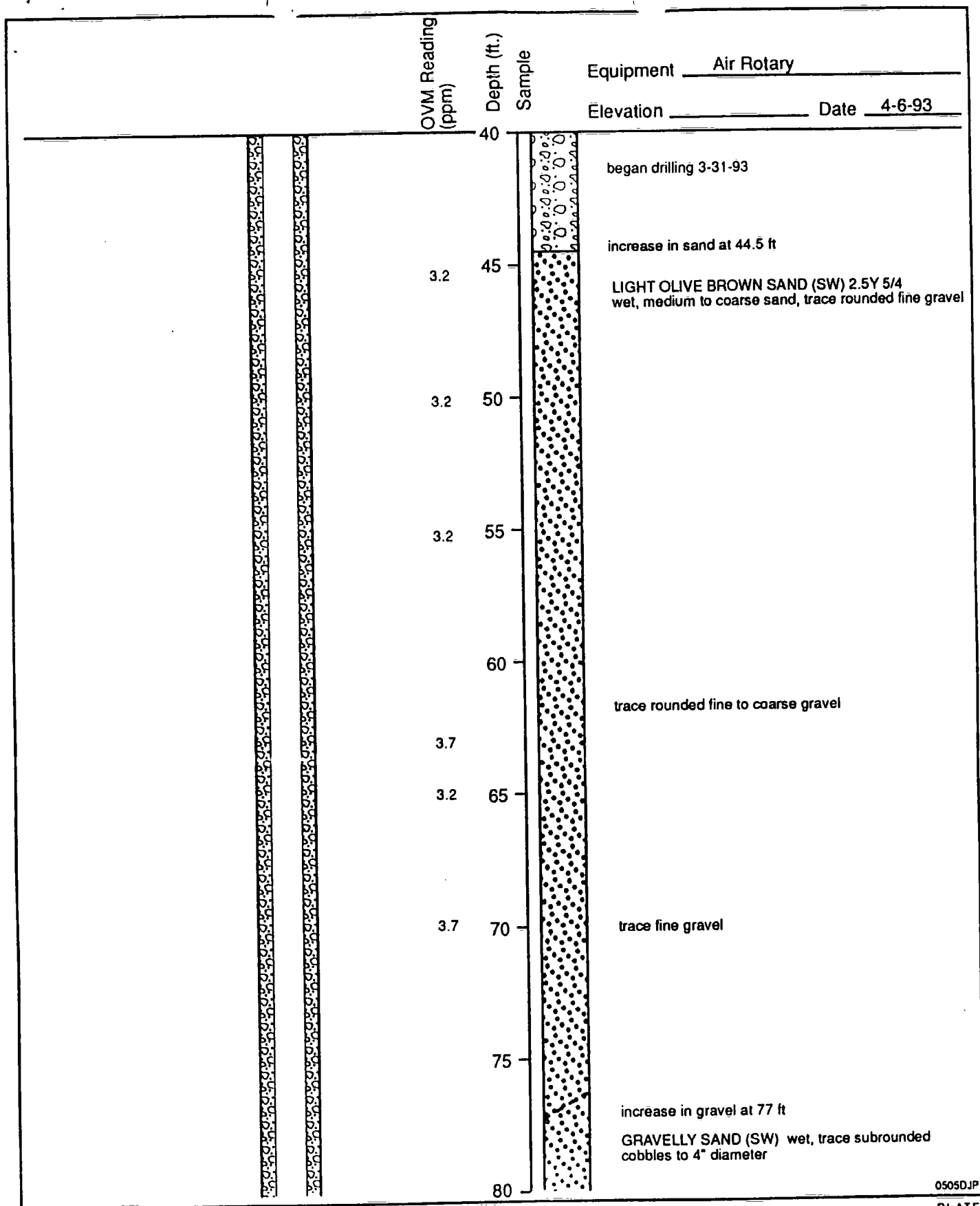
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DATE  
4/93

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**Log of Boring and Well Completion MW-1**  
Van Waters & Rogers Inc.  
Boise, Idaho

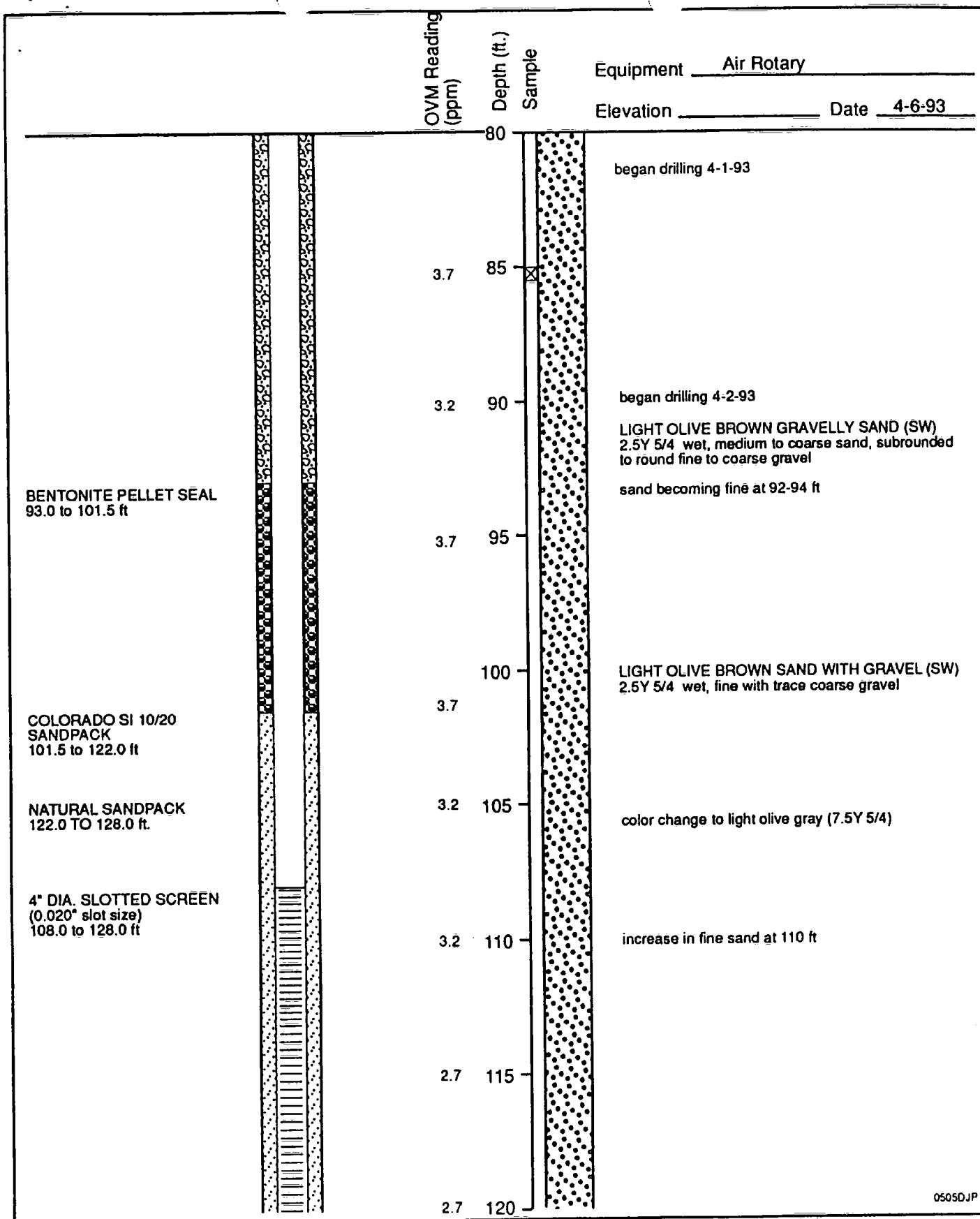
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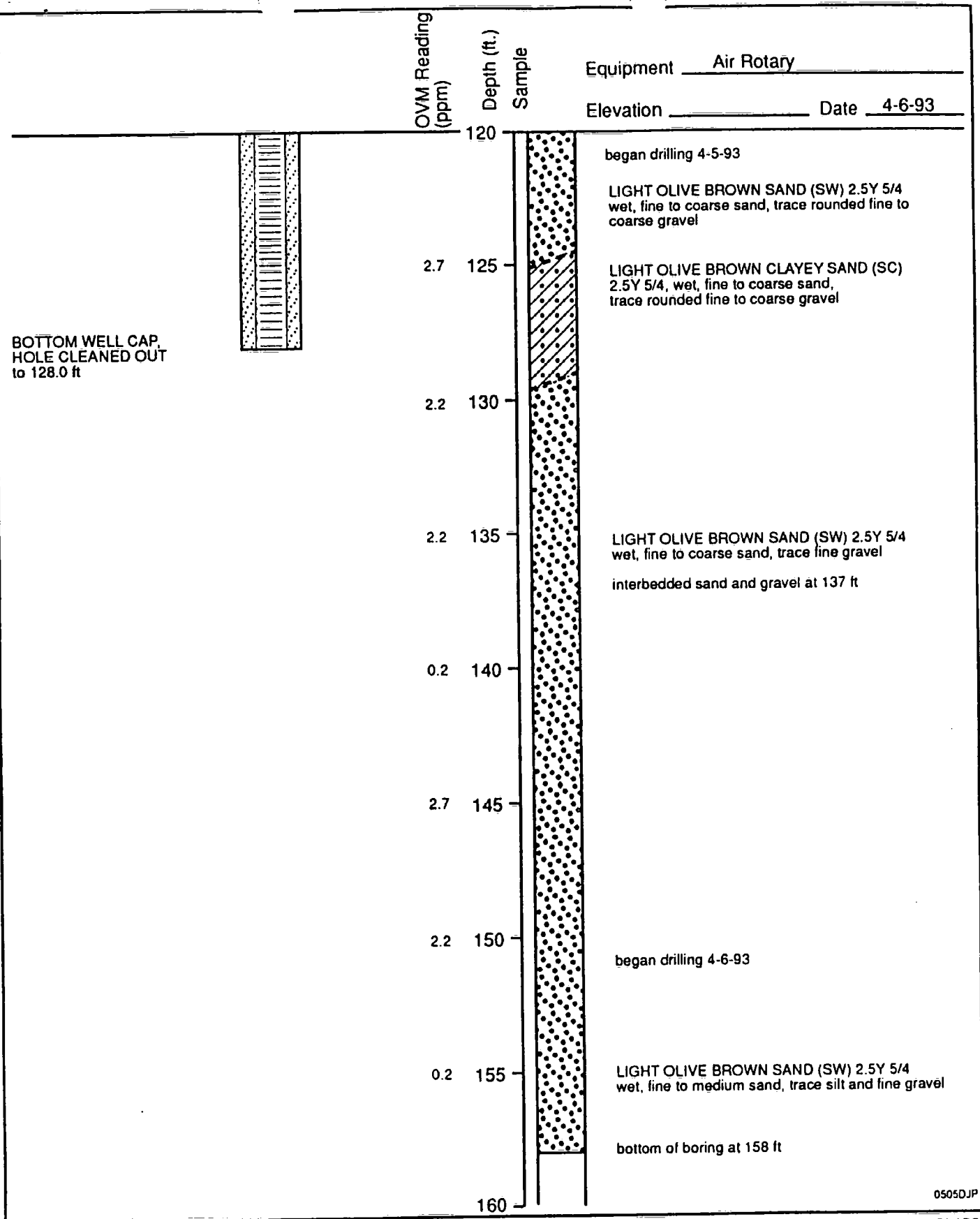
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Van Waters & Rogers Inc.  
Boise, Idaho

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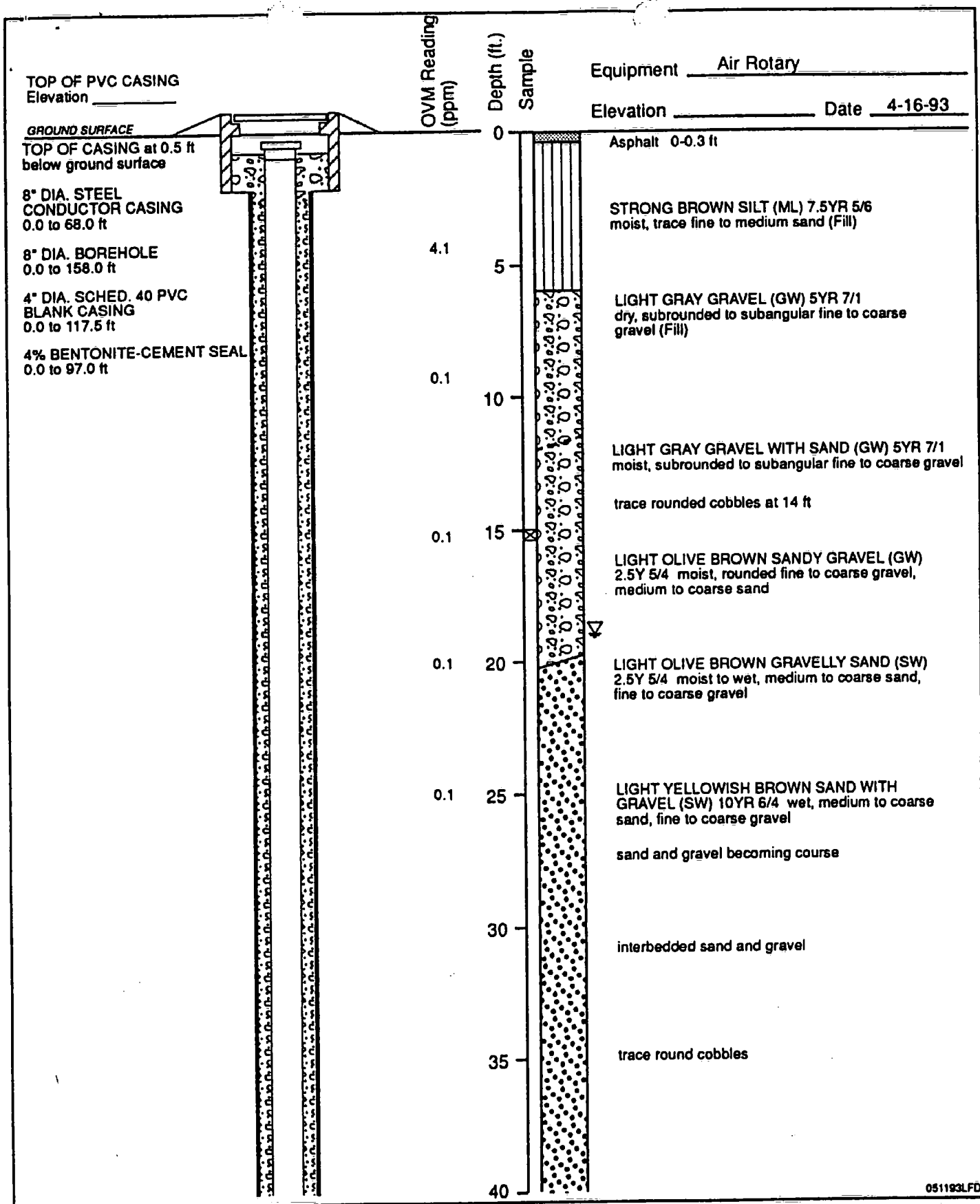
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**Log of Boring and Well Completion MW-2**  
**Van Waters & Rogers Inc.**  
 Boise, Idaho

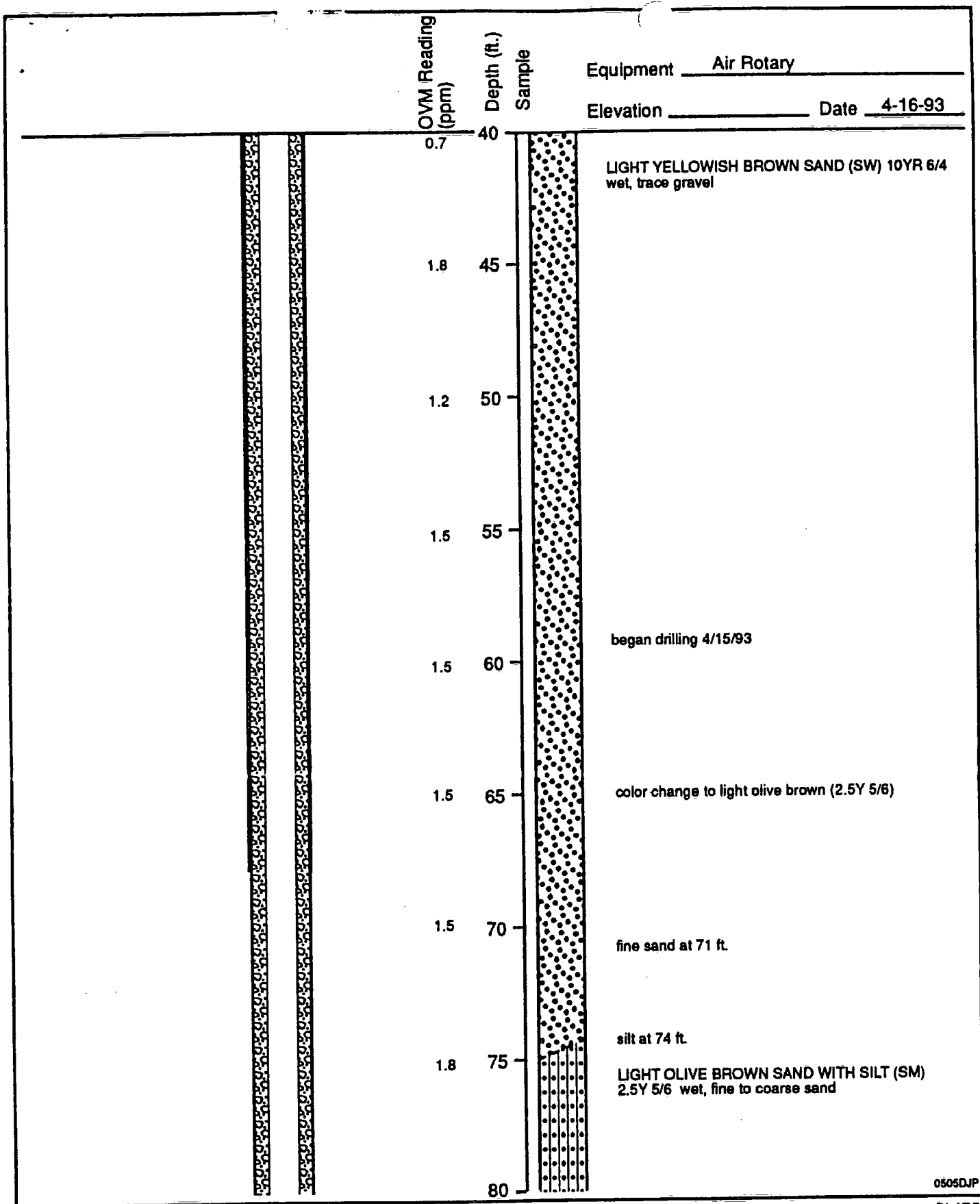
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**Log of Boring and Well Completion MW-2**  
**Van Waters & Rogers Inc.**  
Boise, Idaho

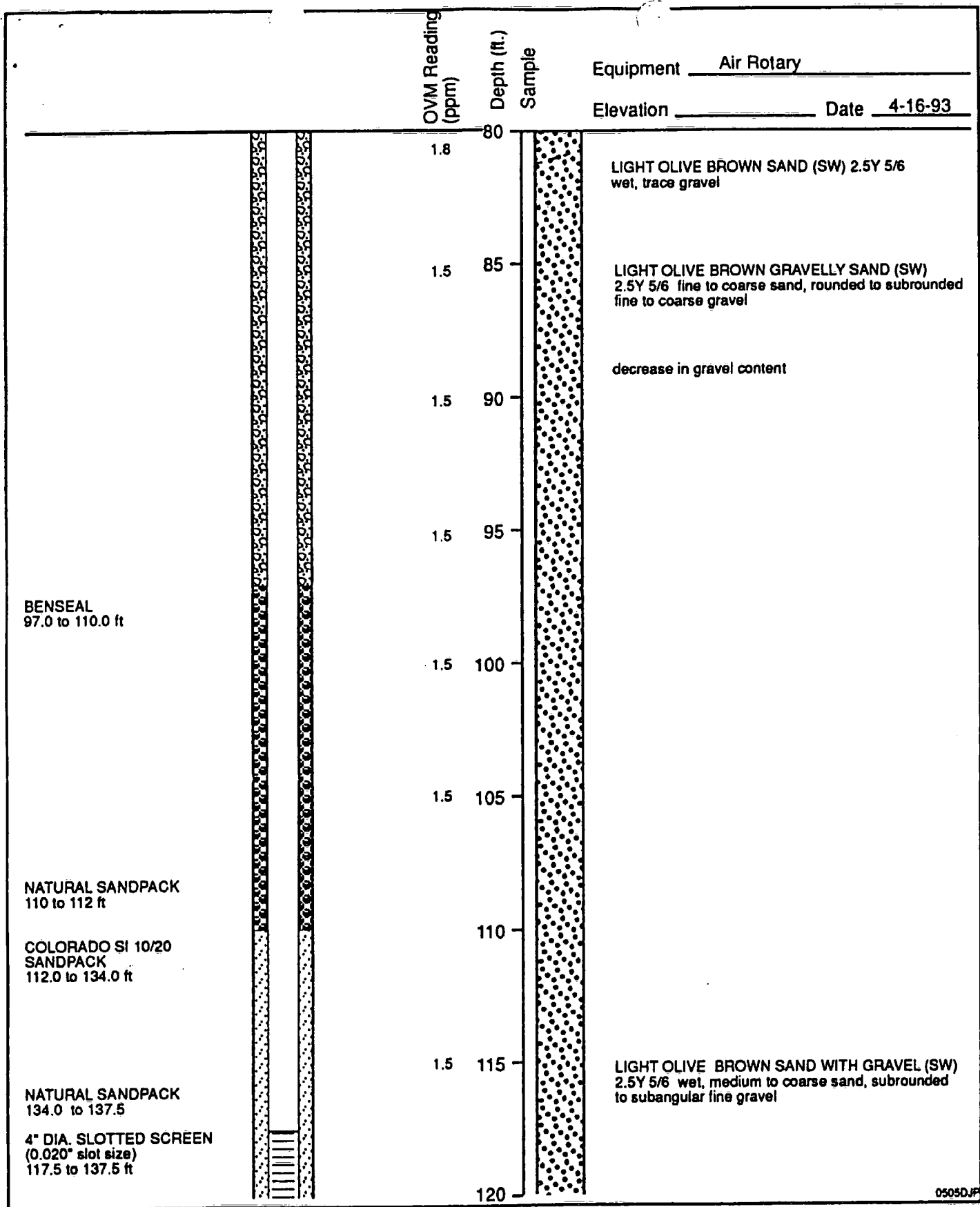
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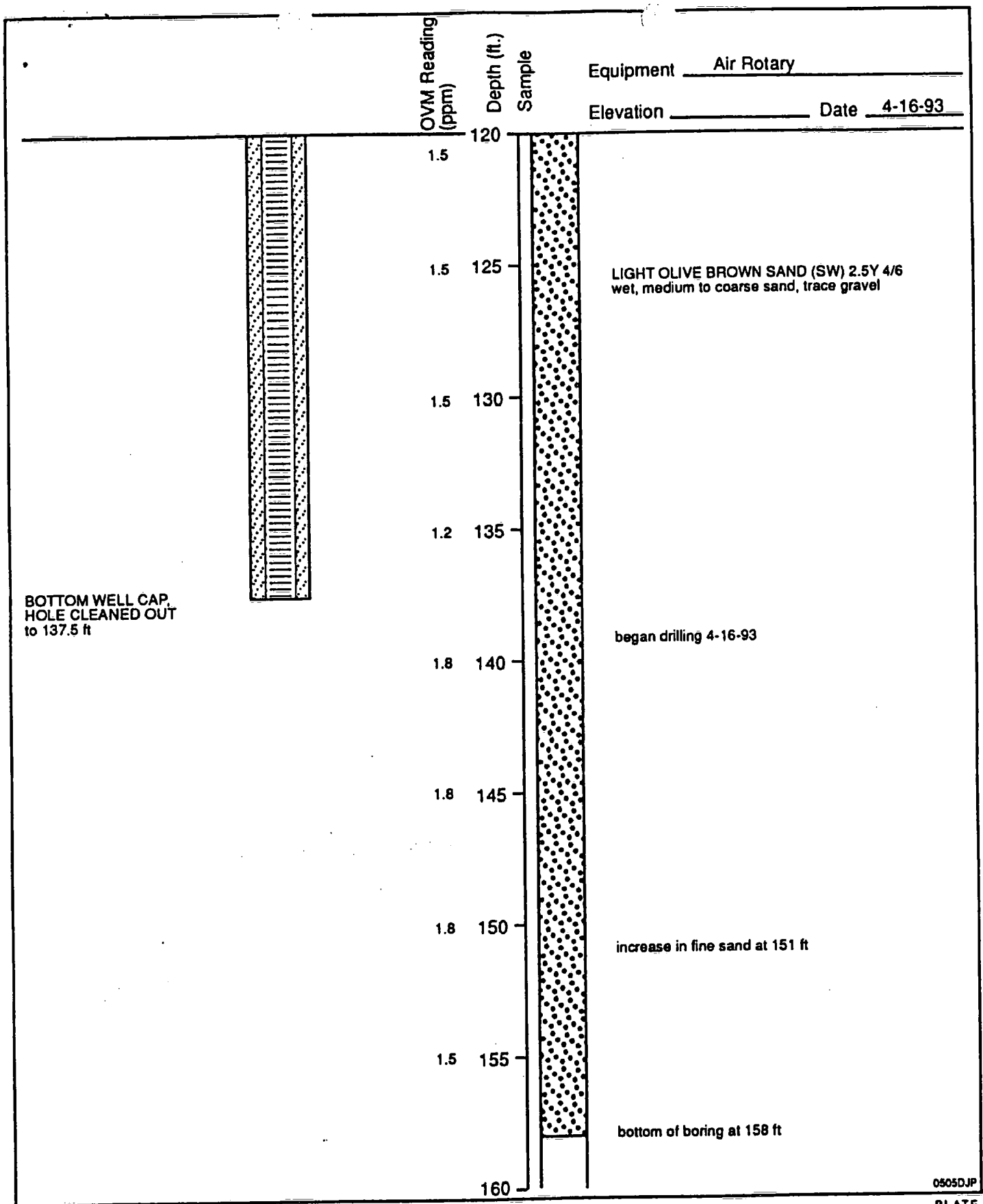
**Log of Boring and Well Completion MW-2**  
**Van Waters & Rogers Inc.**  
**Boise, Idaho**

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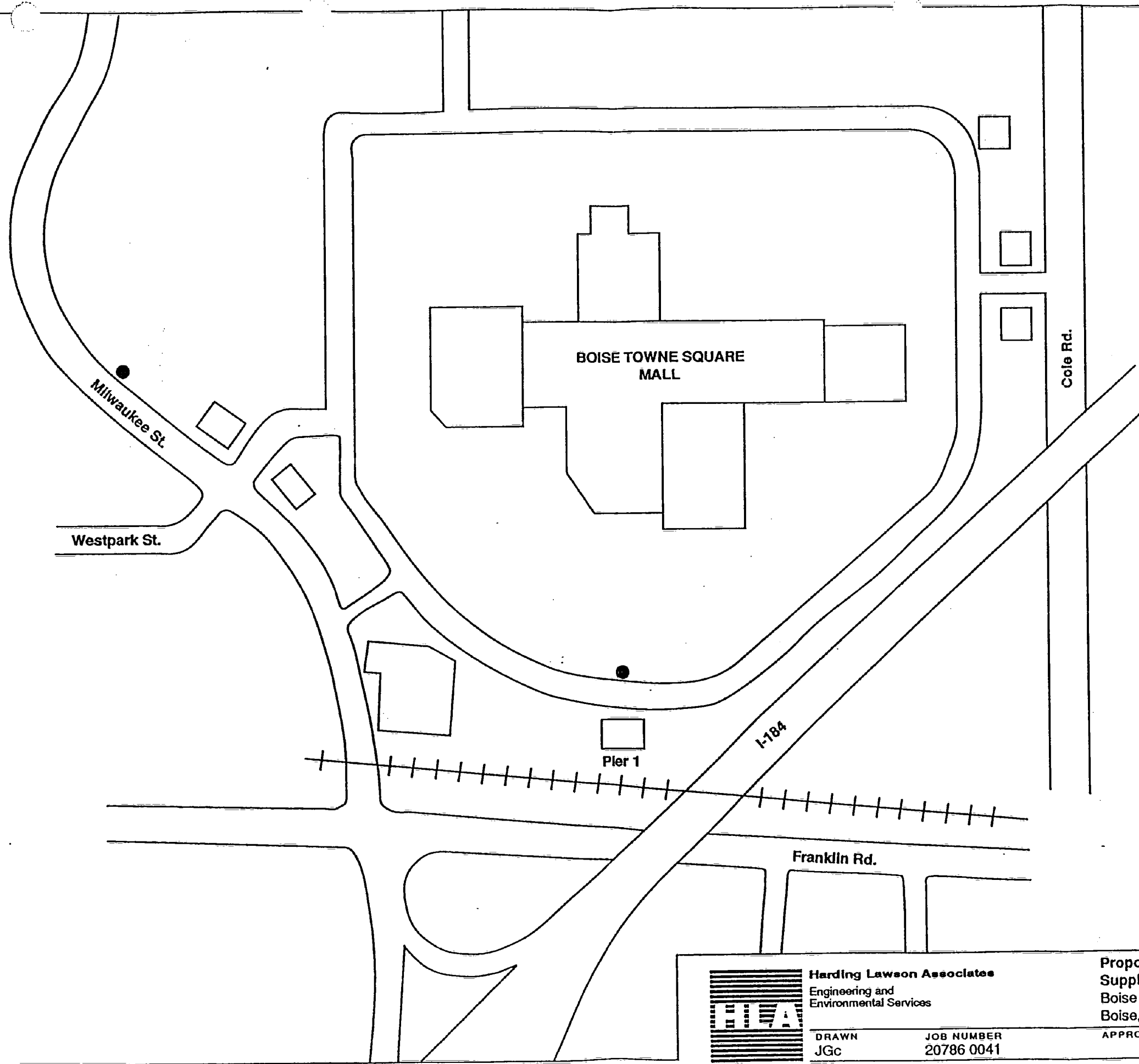
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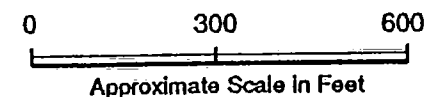


**EXPLANATION**

● Proposed Pilot Boring

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**Proposed Pilot Boring Locations**  
**Supplemental Pilot Boring SAP**  
Boise Towne Square Mall  
Boise, Idaho

APPROVED: \_\_\_\_\_  
DATE: 11/92

REVISED DATE: \_\_\_\_\_